DOCUMENT RESUME

ED 179 642 UD 019 973

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TITLE The Association Between Pupil Attendance and Socio-Economic Status in the Community School Districts of New York City.
INSTITUTION New York City Board of Education, Brocklyn, N.Y. Office of the Deputy Chancellor.
PUB DATE Mar 77
NOTE 51p.; Paper presented at the American Education Finance Conference (San Antonio, Texas, March, 1977)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Average Daily Attendance; *City Problems; *Educational Finance; Elementary Secondary Education; Equal Education; Finance Reform; Resource Allocations; *State Aid; Tax Allocation; Urban Areas; *Urban Schools
IDENTIFIERS New York; New York (New York)

ABSTRACT

In discharging its constitutional responsibility for maintaining and supporting free public schools, the state financially aids local school districts to insure that lack of wealth is not an obstacle to providing at least a minimum educational program. State aid to education in New York State is dependent on two factors: the full value of real property and the number of pupils in average daily attendance. From the point of view of the five largest cities in the State, the use of these factors is discriminatory. The aid formulae used by the State make extensive use of the full value of real property per resident pupil in weighted average attendance as a measure of the school district's wealth. Because they are property rich and also have low attendance rates, the large cities are apportioned the same aid per pupil as other equally rich school districts even though these districts have higher income levels. In addition, pupil attendance is strongly associated with the socio-economic status of the district's residents. Therefore, a community with high socio-economic status will receive more State educational aid than one having low socio-economic status. An attendance based aid distribution scheme fails to serve the purpose of equalization of educational opportunity. (Author/RLV)

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THE ASSOCIATION BETWEEN PUPIL ATTENDANCE AND SOCIO-ECONOMIC STATUS IN THE COMMUNITY SCHOOL DISTRICTS OF NEW YORK CITY

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UD019973

Presented at the American Education Finance Conference
San Antonio, Texas
March 1977

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I. A POLICY FRAMEWORK FOR ANALYZING STATE AID TO EDUCATION

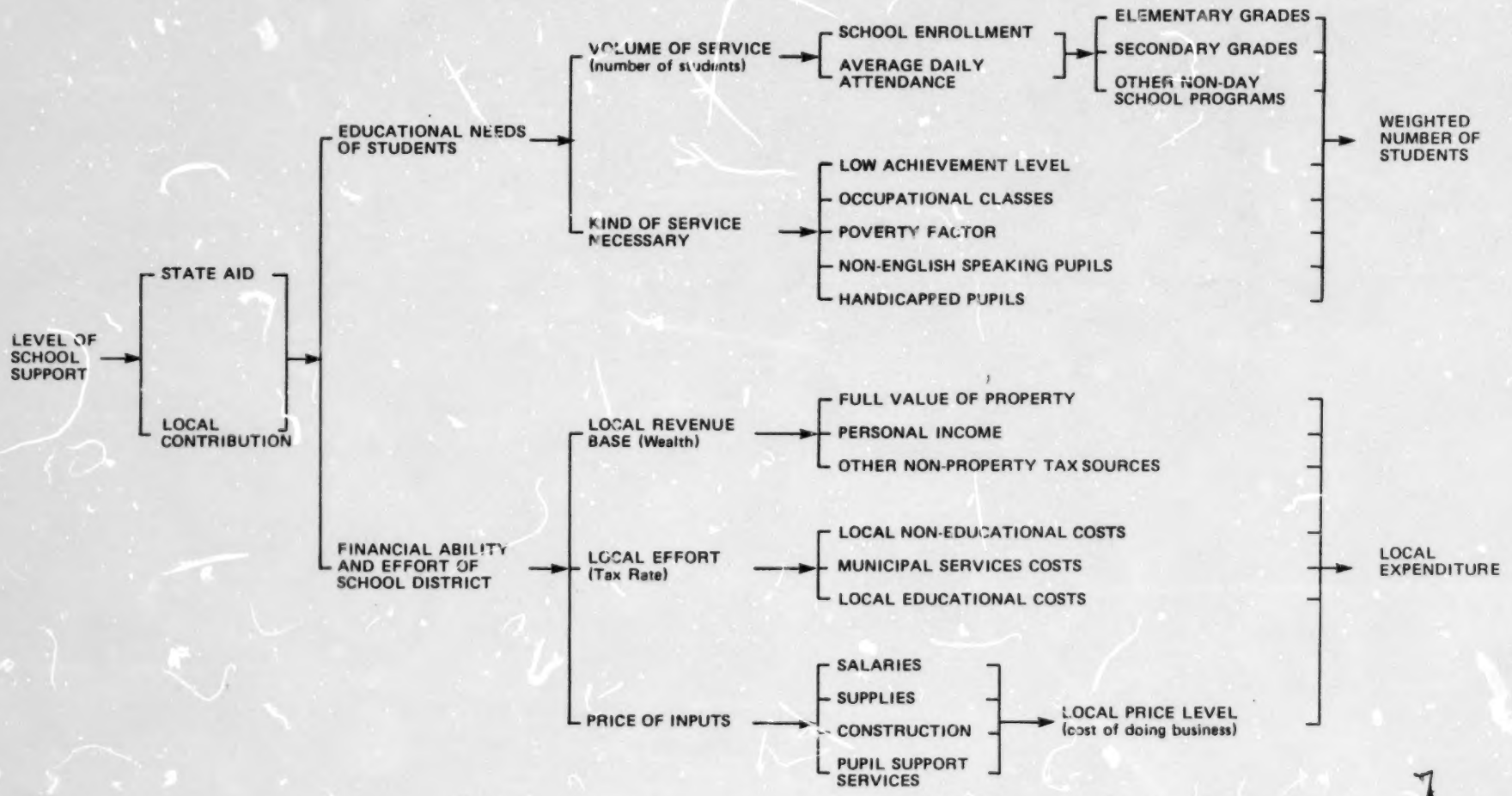
The State of New York has a constitutional responsibility for maintaining and supporting free public schools. In discharging its responsibility, the state financially aids local school districts to insure that the lack of wealth is not an obstacle to providing at least a minimum educational program. An active financial role by the state is needed because the revenue raising capacity of local school districts varies considerably. Without state aid, the poorest districts would be forced to tax themselves heavily inorder to meet just the state's minimum educational requirements while richer districts would have a relatively lighter tax burden. State financial aid is supposed to rectify this situation.

The means for distributing state aid among the school districts is a set of formulae. The formulae are a practical solution to the question: How should educational resources be distributed?

For purposes of state aid, the state has established the cost per pupil of a minimum educational program. The state has agreed to share this cost with local districts. The fairness of the distribution of state aid among the state's more than 700 school districts depends on the interplay between a local district's demand for educational services and its capacity to provide these services (see Exhibit 1).

EXHIBIT I

DETERMINANTS OF AID TO SCHOOL DISTRICTS IN NEW YORK



The demand for educational services depends on the educational needs of a district's students. Educational needs, in turn, are determined by the number of pupils, their attendance rate, and their distribution among grade levels. Educational needs are also determined by the kinds of services required because of low achievment levels, the effects of poverty, an inability to speak English, the unusual requirements of occupational training classes, and the special needs of pupils with handicapping conditions. All of these factors are summarized by a weighted pupil count that measures the district's demand for educational services.

A district's capacity to provide educational services depends on its financial ability and its willingness to tax itself. Financial ability is determined by the size of the local revenue base, which is made up of real property, personal income, and other property and non-property tax sources. Financial willingness, or effort, is measured by the tax rates imposed to pay for local educational costs and local non-educational, municipal services cost. Financial ability is also affected by the local purchasing power of a district's dollar, which is determined by the relative prices of inputs; such as, labor (wages, salaries, fringe benefits), supplies and services, pupil support services (school lunches and transportation), and construction (land, building, debt service). All of these factors determined the local expenditure level for providing educational services.

II. PUPIL ATTENDANCE AND STATE AID IN NEW YORK

State aid to education in New York is heavily dependent on two factors: the full value of real property and the number of pupils in average daily attendance. These factors determine the aid per pupil and the total aid. The inequitable distribution of aid among the state's 3.4 million pupils is largely due to the critical role played by these two factors in the many aid formulae.

From the point of view of the five largest cities in New York State, the use of pupil attendance and the reliance on property value as the sole measure of wealth are discriminatory. The aid formulae make extensive use of the full value of real property per resident pupil in weighted average attendance* as the measure of a school district's wealth. Because they are property rich and also have low attendance rates, the large cities are apportioned the same aid per pupil as other equally rich school districts even though these other districts have higher income levels.

The evidence supporting this conclusion is presented in Exhibit 2. For each of the five largest city school districts in New York State and for each of the five boroughs that make up New York City,** the full value per resident WADA and the resulting aid per pupil are shown. Four other measures of wealth are also shown along with percent of minority pupils in each district.

*Referred to as "full value per resident WADA" for short.
**When computing its state education aid, New York City is permitted to treat each borough as if it were a separate school district.

EXHIBIT 2

WEALTH COMPARISONS FOR THE LARGE CITY SCHOOL DISTRICTS AND DISTRICTS RECEIVING SIMILAR AMOUNTS IN STATE AID PER PUPIL*

DISTRICT	FULL VALUE PER RESIDENT WADA	FORMULA AID PER RESIDENT WADA	MEASURES OF WEALTH: MEAN FAMILY INCOME	PER CAPITA INCOME	PERCENT FAMILIES IN POVERTY	PER CAPITA FULL VALUE	PERCENT MINORITY ENROLLMENT**	NUMBER OF DISTRICTS	ENROLLMENT
New York City	$67,613	$393.38	$11,639	$ 3,721	11.5%	$ 8,606	66.8%	-	1,100,224
Equally Rich Districts	64,613 - 70,613	390.38 - 396.38	18,598	5,206	4.8	13,210	14.7	17	57,000
Bronx	28,696	769.56	9,635	2,943	15.5	3,992	83.0	-	228,061
Equally Rich Districts	25,696 - 31,696	724.56 - 814.56	12,181	3,223	5.8	7,558	4.8	104	457,600
Brooklyn	38,291	625.63	10,181	3,072	13.9	5,239	69.0	-	390,965
Equally Rich Districts	35,291 - 41,291	580.63 - 670.63	14,036	3,779	4.3	9,085	4.2	40	182,300
Manhattan	181,009	360	14,242	5,255	13.1	17,882	86.3	-	173,445
Equally Rich Districts	101,000 or more	360	19,857	5,722	4.3	22,900	16.3	25	34,400
Queens	71,455	389.54	13,003	4,046	5.5	8,570	47.0	-	249,941
Equally Rich Districts	68,455 - 74,455	386.54 - 392.54	20,006	5,696	5.1	13,072	21.6	16	55,000
Staten Island	60,386	400.61	12,934	3,516	4.8	11,106	15.6	-	57,812
Equally Rich Districts	57,386 - 63,386	397.61 - 403.61	18,516	4,993	3.8	12,501	6.4	20	48,000
Buffalo	33,120	703.20	9,968	2,933	11.2	4,194	49.4	-	58,818
Equally Rich Districts	30,120 - 36,120	658.20 - 748.20	13,428	3,564	5.1	8,489	5.5	82	361,400
Rochester	52,650	410.25	10,762	3,223	8.9	7,173	50.4	-	43,107
Equally Rich Districts	49,650 - 55,650	405.35 - 455.25	14,715	4,045	4.5	10,519	18.7	27	79,900
Syracuse	42,569	561.46	10,835	3,240	9.8	5,533	34.7	-	26,537
Equally Rich Districts	39,569 - 45,569	516.46 - 606.46	14,590	3,965	3.9	10,057	5.1	45	170,900
Yonkers	66,817	394.18	13,933	4,248	5.6	9,041	31.0	-	29,374
Equally Rich Districts	63,817 - 69,817	391.18 - 397.18	18,460	5,105	4.4	13,937	17.7	15	52,600

Sources: All data was compiled from the 1974-1975 BEDS file of the New York State Department of Education except for the minority enrollment in New York City and its boroughs. This was obtained from the Annual Pupil Ethnic Census report published by the Office of Educational Statistics in the New York City Board of Education. All income figures on the BEDS file are taken from the 1970 U.S. Census. In certain cases, data was missing from the BEDS file and was obtained directly from census publications.

*Full value per resident WADA is for the 1973-74 school year while all income figures are for 1969. The percent minority enrollment is for the 1974-75 school years.

**The percent minority enrollment is for grade 6 for all districts other than New York City and its boroughs, in which case it includes all grades.

Corresponding to each city school district and borough, similar data are shown for districts that are equally rich (as far as the aid formulae are concerned). A cursory examination of the data leads to the inescapable conclusion that the city school districts are not as rich as as these other districts. According to all the other measures of financial ability to provide for public services (including education), the city school districts are considerably poorer than their supposedly equally rich counterparts.

This disparate impact is due largely to the reliance on only property value as the measure of wealth and the use of attendance rates to weight the number of pupils. The consequences of using pupil attendance are analyzed in the remainder of this paper. The analysis of property value is left for another time.

III. THE ASSOCIATION BETWEEN PUPIL ATTENDANCE AND SOCIO-ECONOMIC STATUS

The study reported in this paper demonstrates that pupil attendance within a New York City community school district is strongly associated with the socio-economic status of the district's residents. In fact, the association is so strong that knowledge about a district's socio-economic status can be used to predict--with a very high degree of accuracy--its average rate of pupil attendance. Once the socio-economic status of a given district is accounted for, other factors over which the schools exercise control (e.g. the ratio of attendance teachers to pupils, expenditure level, and class size) have only a marginal influence on pupil attendance.

The nature of the association between socio-economic status and attendance is such that the following statements can be made with a high level of confidence:

- A LOW SOCIO-ECONOMIC STATUS DISTRICT WILL HAVE A LOW RATE OF PUPIL ATTENDANCE.
- AN AVERAGE SOCIO-ECONOMIC STATUS DISTRICT WILL HAVE AN AVERAGE RATE OF PUPIL ATTENDANCE.
- A HIGH SOCIO-ECONOMIC STATUS DISTRICT WILL HAVE A HIGH RATE OF PUPIL ATTENDANCE.

Though the results of this study may seem obvious, they represent the first rigorous empirical "proof" of what informed intuition would tell us about the relationship between attendance and socio-economic status.

The implications of this study are ominous if one considers the prominence of pupil attendance in determining the amount of education aid which New York State allocates to each of its local school districts. Since a significant portion of state education aid is based on pupil attendance rather than enrollment, and attendance is strongly associated with the socio-economic characteristics of the community being served, it would appear that this part of the state's education aid formula gratuitously favors a clearly definable segment of the total population. All other things being equal, a community having high socio-economic status will receive more state education aid than one having low socio-economic status (see Exhibit 3). This form of discrimination is especially onerous since a school district has little, if any, direct and immediate control over the various factors (e.g. poverty and wealth) which characterize a community's socio-economic status.

Although this study makes no pretense of having examined legal and constitutional questions related to the distribution of state education aid, it does raise at least one compelling issue. Equalization of educational opportunity is one of the avowed purposes of the aid formula in New York State. An attendance-based distribution scheme not only fails to serve this purpose, but also seriously undermines other aspects of the formula which do.

EXHIBIT 3

ALL OTHER THINGS BEING EQUAL A HIGH SES DISTRICT

WILL RECEIVE MORE STATE AID THAN A LOW SES DISTRICT

	DISTRICT A	DISTRICT B	% DIFFERENCE (B over A)
Weighted Enrollment	1,000	1,000	0%
Full Value of Property	$20,000,000	$20,000,000	0%
Attendances Rate	80%	90%	12.5%
Weighted Average Daily Attendance (WADA)	800	900	12.5%
Ful Value/WADA	$25,000	$22,222	-11.1%
Aid Per Pupil in WADA	$825.00	$866.67	5.1%
Total Aidable Pupil Units (TAPU)	800	900	12.5%
Total Aid	$660,000	$780,000	18.2%
Aid Per Pupil in Weighted Enrollment	$660	$780	18.2%
Socio-Economic Status	Low	High	--

IV. PREDICTING ATTENDANCE

Attendance rates for New York City's thirty-two decentralized community school districts range from a low of 82.9% to a high of 91.9%.

DISTRICT	ATTENDANCE	DISTRICT	ATTENDANCE	DISTRICT	ATTENDANCE
1	82.9%	13	85.9%	2	89.1%
32	83.0	5	86.0	18	89.6
23	83.1	8	86.1	22	89.7
9	83.9	7	86.3	11	90.0
12	84.1	15	86.6	24	90.2
16	84.2	6	87.3	30	90.2
4	85.1	21	87.5	29	91.1
19	85.1	27	88.1	25	91.3
14	85.6	20	88.2	31	91.5
3	85.7	17	88.7	26	91.9
10	85.8	28	88.7		

1. THE MEAN

Knowing only whatever information can be gleaned from the above table, if one wanted to predict a district's attendance rate, a good bet would be a middle value because the attendance rates tend to concentrate toward middle values and are less frequent at the lowest and highest values (see Exhibit 4). A measure of the central tendency is the average or mean value, which is computed from the following expression:

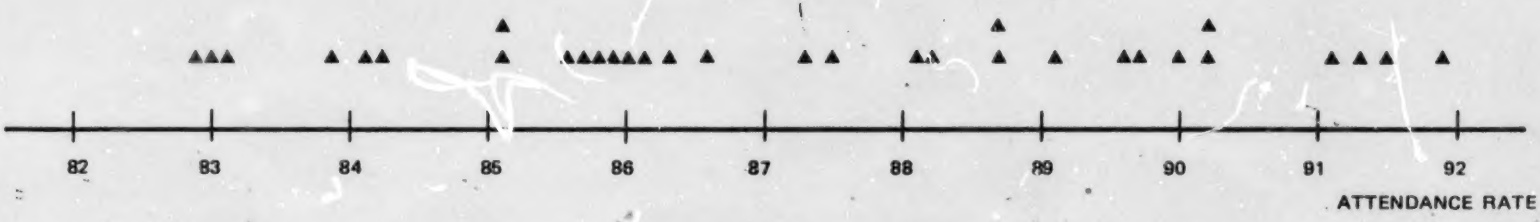
$$\text{MEAN ATTENDANCE RATE} = \frac{\sum_{\text{ALL 32 DISTRICTS}} \text{DISTRICT d ATTENDANCE RATE}}{32 \text{ DISTRICTS}}$$

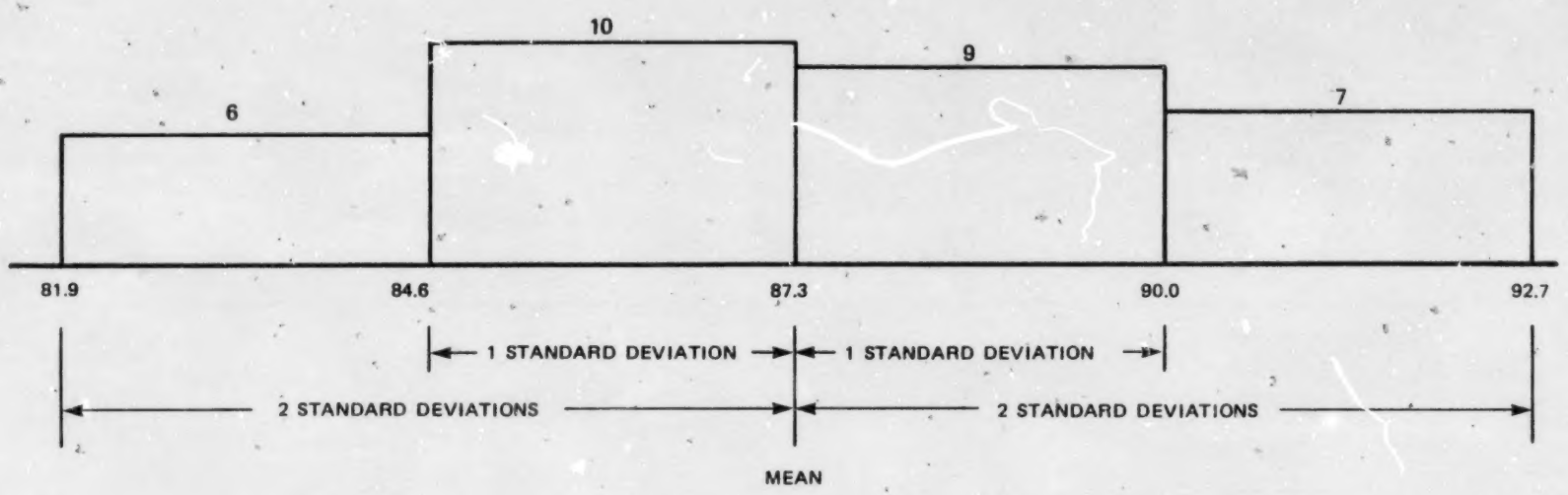
$$= \frac{2[illegible].5}{32}$$

$$= 87.3$$

EXHIBIT 4

FREQUENCY HISTORGAM OF ATTENDANCE RATES





Thus, a reasonable prediction for a district's attendance rate is 87.3%, the mean value.

But how confident are we of being correct? To put it another way if we were to predict the attendance rates of many districts, how often would our prediction be correct? If we could select only one number, we would almost never hit it on the head because the problem, as posed, is an impossible one.

2. THE VARIANCE AND STANDARD DEVIATION

Let us rephrase the question to make the problem more solvable. If we could specify a range for our predicted attendance rate, what is the smallest range around the mean that would give us a success rate of, say, 95%.

To answer this question we need a measure of dispersion or variation so that we can determine the spread or concentration of attendance rates among the mean. The variance and its companion, the standard deviation, can help us. Put another way, the variance measures the deviation of attendance rates from the mean, and this is the basis for computing this statistic.

$$\text{VARIANCE OF THE ATTENDANCE RATE} = \frac{\sum_{\text{ALL 32 DISTRICTS}} \left[\text{DISTRICT d ATTENDANCE RATE} - \text{MEAN ATTENDANCE RATE}\right]^2}{32 \text{ DISTRICTS} - 1}$$

$$= \frac{223.87}{31}$$

$$= 7.22$$

For this statistic, the deviations are squared, which keeps positive and negative deviations from canceling each other and makes the extreme values -- high and low -- more influential than values close to the mean. Dividing by the number of districts less one gives us an "average" squared deviation.

The standard division is merely the square root of the variance.

$$\begin{array}{l}\text{STANDARD DEVIATION OF THE ATTENDANCE RATE}\end{array} = \sqrt{\text{VARIANCE OF THE ATTENDANCE RATE}}$$

$$= \sqrt{7.22}$$

$$= 2.7$$

Taking the square root "reverses" the effect of squaring the deviations and gives us a standardized measure of dispersion that has the same units of measurement as the original variable.

To return to our prediction problem, the standard deviation can be used to define the smallest range around the mean to give us the sucess rate of 95% we seek. If we establish an interval for our predictions, that is, two standard deviations above and below the mean, we can be confident that a district's actual attendance rate will be in this interval 95% of the time (see Exhibit 4). If we want to be more exact, we have to pay the price of lower success:

- An interval of one standard deviation around the mean will drastically cut our success rate to 68%.

- An interval of three standard deviations will marginally increase our success rate to 98%.

Can we restrict the interval without sacrificing our success rate? The answer is yes, but we must pay the price of collecting and interrelating more information about the thirty-two community school districts.

V. SOCIAL CLASS INDICATORS

Even the most casual observer public school systems will agree that there is a relationship between the social class of a community and the attendance rate of its public school students. This intuitive conclusion can be supported by rigorous analysis that measures the impact of socio-economic variables on attendance.

For our analysis, we select three dimensions of social class:

- The concentration of poverty and wealth in a community.

- The residential stability of families in a community.

- The concentration of dependency in a community.

In this chapter we will develop social indicators that measure these dimensions of social class (see Exhibit 5).

EXHIBIT 5

MEASURES OF SOCIO-ECONOMIC STATUS

THE CONCENTRATION OF POVERTY IN A COMMUNITY

- POVERTY INDEX: Percent of all families headed by women with family incomes below the poverty level (as defined by U.S. Bureau of the Census).*

THE CONCENTRATION OF WEALTH IN A COMMUNITY

- WEALTH INDEX: Percent of all families with family incomes of $15,000 or more adjusted for the ethnic composition of the K-8 public school enrollment.*

THE RESIDENTIAL STABILITY OF FAMILIES IN A COMMUNITY

- SCHOOL TURNOVER INDEX: The number of admissions and departures (from public schools in a community) divided by the average daily register (of public schools in a community).**

THE CONCENTRATION OF DEPENDENCY IN A COMMUNITY

- DEPENDENCY INDEX: Percent of total population under 18 year of age and over 64 year of age.*

*Basic data derived from U.S. Bureau of the Census, Census of Population: 1970, Fourth Count Summary Tape, New York. Citywide data converted into community school district data as reported in Community School District Profiles: Socio-Economic Characteristics, New York City Planning Commission, July 1974.

**Basic data derived from School Profiles 1974-1975, New York City Board of Education, 1976.

1. POVERTY AND WEALTH

The concentration of poverty and wealth in a community are major indicators of its social class. There are several ways of measuring the concentration of poverty and wealth:

- Family income.
- Poverty level standard established by the U.S. Census Bureau.
- Public assistance recipients.
- Pupils eligible for subsidized school lunches.

For our social indicator of poverty concentration we define a variable that measures a certain kind of poverty:

- Percent of all families headed by women with family incomes below the poverty level.

For our social indicator of wealth concentration we use:

- Percent of all families with family incomes of $15,000 or more adjusted for the ethnic composition of K-8 public school enrollment.

The source of information on both of these indicators is the 1970 U.S. Census.

2. RESIDENTIAL STABILITY

The frequency with which families move, change their place of residence, measures the stability or instability of the community. We measure this turbulence by an index of pupil movement into and out of public schools.

$$\text{SCHOOL TURNOVER INDEX} = \frac{\text{NUMBER OF ADMISSIONS} + \text{NUMBER OF DEPARTURES}}{\text{AVERAGE DAILY REGISTER}}$$

The source of information for the school turnover index is the New York City Board of Education's 1974-1975 School Profiles.

3. DEPENDENCY

A community that has a large number of people younger than 18 years of age and older than 64 has tremendous social burdens that make heavy demands on the service structure. We measure this characteristic by a dependency index:

- Percent of total population under 18 years of age and over 64 years of age.

The source of informat on for the dependency index is the 1970 U.S. Census.

* * * * *

After analyzing the impact on attendance of social class indicators we will consider a factor that the school system controls. Attendance teachers and guidance counselors work with the students who have low attendance rates, and we can measure this controllable factor by a work-load index:

- Number of pupils per attendance teacher and guidance counselor.

The sources of information for this indicator are the New York City Board of Education's 1974-1975 school profiles and Bureau of Attendance assignment records.

The data for our analysis are listed in Exhibit 6.

Exhibit 6

DATA ON ATTENDANCE, SOCIO-ECONOMIC STATUS INDICATORS, AND ATTENDANCE TEACHER AND GUIDANCE COUNSELOR WORKLOAD

(NEW YORK CITY COMMUNITY SCHOOL DISTRICTS)

DISTRICT	ATTENDANCE RATE	TURNOVER INDEX	POVERTY INDEX	DEPENDENCY INDEX	WEALTH INDEX	WORKLOAD INDEX
1.	82.9	54.1	46.1	40.2	6.9	849.
32.	83.0	81.2	47.8	48.2	6.4	552.
23.	83.1	66.2	53.1	52.2	5.4	599.
9.	83.9	76.9	39.6	44.6	8.3	1210.
12.	84.1	80.3	54.0	47.4	6.4	604.
16.	84.2	60.2	49.8	48.3	6.2	742.
4.	85.1	62.8	49.1	47.4	5.3	596.
19.	85.1	67.1	47.5	48.7	8.5	653.
14.	85.6	60.3	46.1	46.0	6.7	575.
3.	85.7	57.4	27.9	34.9	19.7	771.
10.	85.8	69.1	23.0	40.9	19.8	832.
13.	85.9	62.6	41.2	41.0	10.5	597.
5.	86.0	47.5	36.4	40.4	7.8	696.
8.	86.1	60.8	41.4	43.9	11.7	769.
7.	86.3	66.1	53.1	47.3	4.7	558.
15.	86.6	59.2	33.8	42.3	12.1	679.
6.	87.3	62.4	21.9	39.1	14.6	668.
21.	87.5	47.8	24.0	41.1	22.3	575.
27.	88.1	55.2	22.3	42.6	24.5	998.
20.	88.2	48.5	20.5	40.5	21.5	785.
17.	88.7	67.5	29.9	40.8	13.3	547.
28.	88.7	56.8	17.5	38.3	29.0	719.
2.	89.1	55.5	17.0	29.7	36.5	743.
18.	89.6	48.6	23.4	38.3	24.5	587.
22.	89.7	42.9	13.8	38.7	32.3	899.
11.	90.0	46.4	16.9	40.0	24.6	792.
24.	90.2	56.1	12.7	37.5	25.2	695.
30.	90.2	53.9	15.5	38.0	21.2	866.
29.	91.1	54.5	17.9	41.1	29.5	684.
25.	91.3	43.7	11.5	37.0	35.9	943.
31.	91.5	41.1	17.6	43.4	30.2	922.
26.	91.9	37.6	11.2	36.7	44.9	765.

VI. ATTENDANCE AND SOCIO-ECONOMIC STATUS: A REGRESSION ANALYSIS

Section

1 RELATING ATTENDANCE TO A SOCIAL CLASS INDICATOR

Exhibit 7 - Scattergram of Attendance and Poverty

Exhibit 8 - Relationship between attendance and Poverty

2 QUANTIFYING THE RELATIONSHIP BY REGRESSION ANALYSIS

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Exhibit 10 - Explanation of Correlation Coefficients (r)

Exhibit 11 - Regression or Least Squares

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3 SIMPLE REGRESSION RESULTS

Exhibit 13 - Simple Correlation Coefficients

Exhibit 14 - Regression of Attendance and Poverty

Exhibit 15 - Attendance and Wealth

Exhibit 16 - Attendance and Neighborhood Instability

Exhibit 17 - Attendance and Dependent Population

Exhibit 18 - Attendance & Attendance Teacher and Guidance Counselor Workload

4 MULTIPLE REGRESSION RESULTS

Exhibit 19 - Multiple Regression Results

Exhibit 20 - Goodness of Fit of Regression Equations Relating to Attendance Socio-Economic Status and Workload

5 AN ACCURATE PREDICTION OF ATTENDANCE

Exhibit 21 - Standard Deviation of Attendance Adjusted for Socio-Economic Status and Workload

EXHIBIT 7

SCATTERGRAM OF ATTENDANCE AND POVERTY

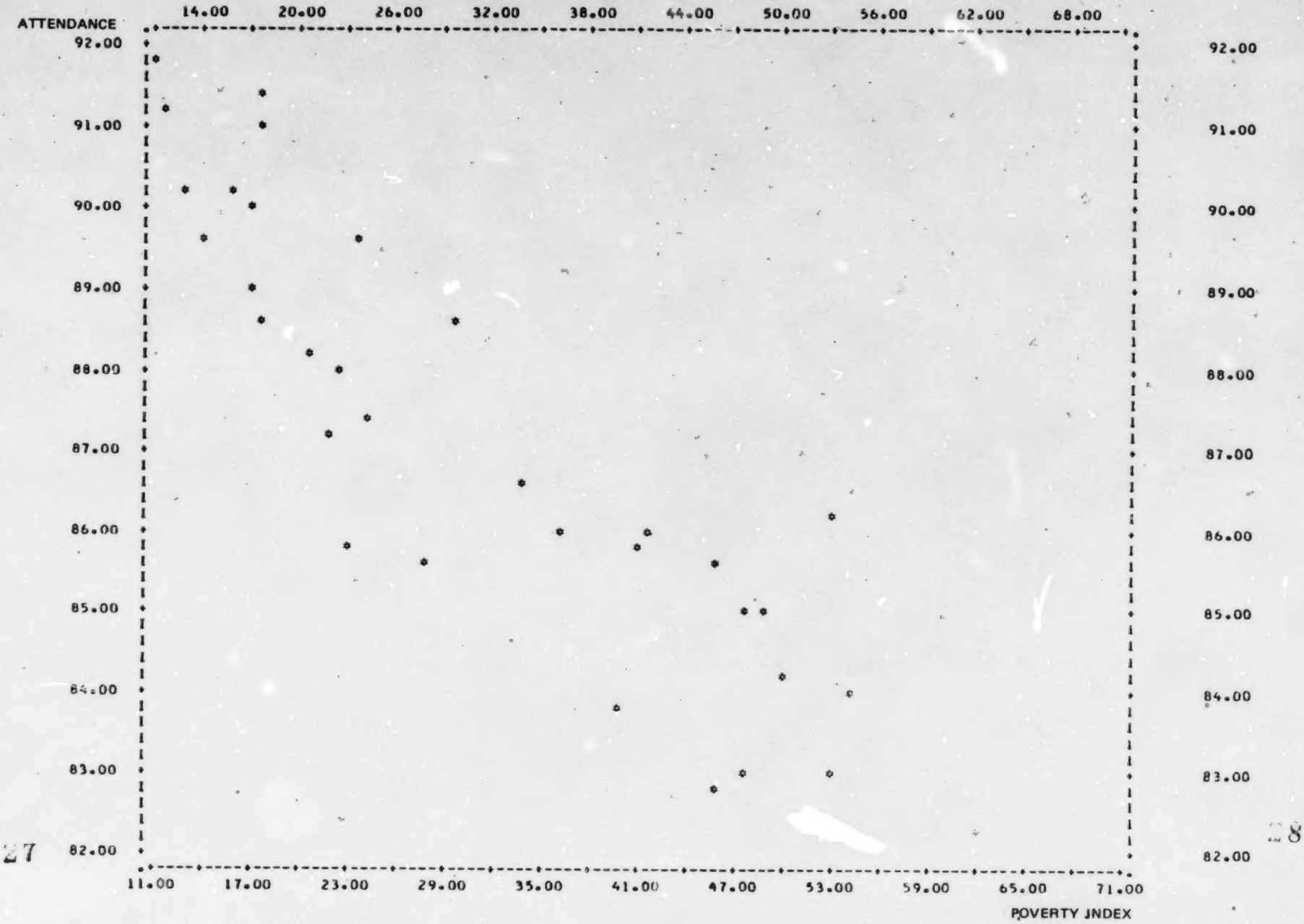

EXHIBIT 8

RELATIONSHIP BETWEEN ATTENDANCE AND POVERTY

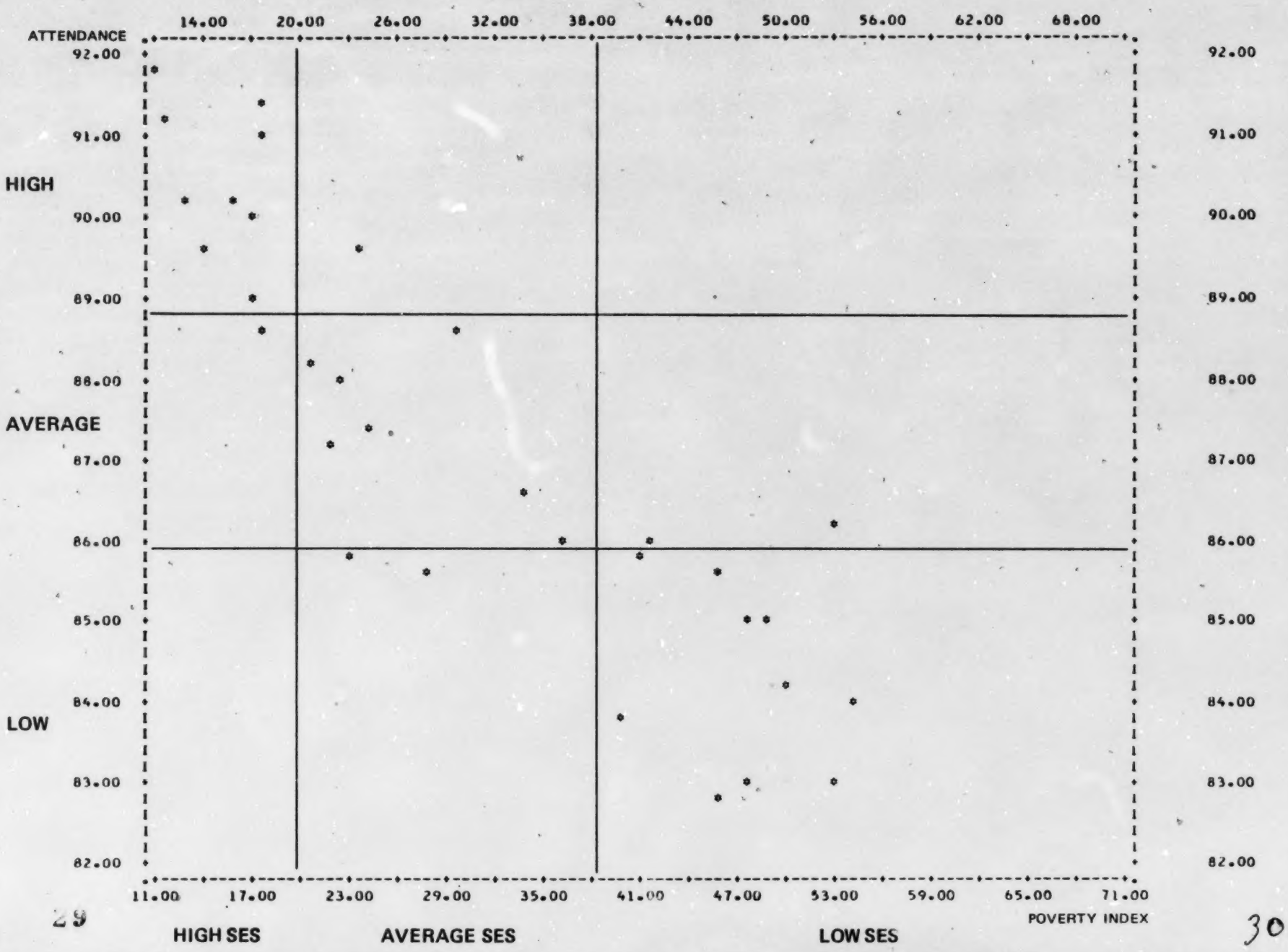

EXHIBIT 9

THE RELATIONSHIP BETWEEN ATTENDANCE AND POVERTY

- The correlation coefficient tells us the strength and direction of the relationship.
  - The correlation between attendance and poverty is −.88. The relationship is strong: low poverty concentration is associated with high attendance rates and high poverty concentration is associated with low attendance rates.
- The regression line tells us what the relationship is; it tells us values for *a* and *b* in the equation:
  [Attendance Rate] = *a* + *b* [Poverty Index]
  - The line relating attendance to poverty is
    [Attendance Rate] = 92.3 − 0.163 [Poverty Index]

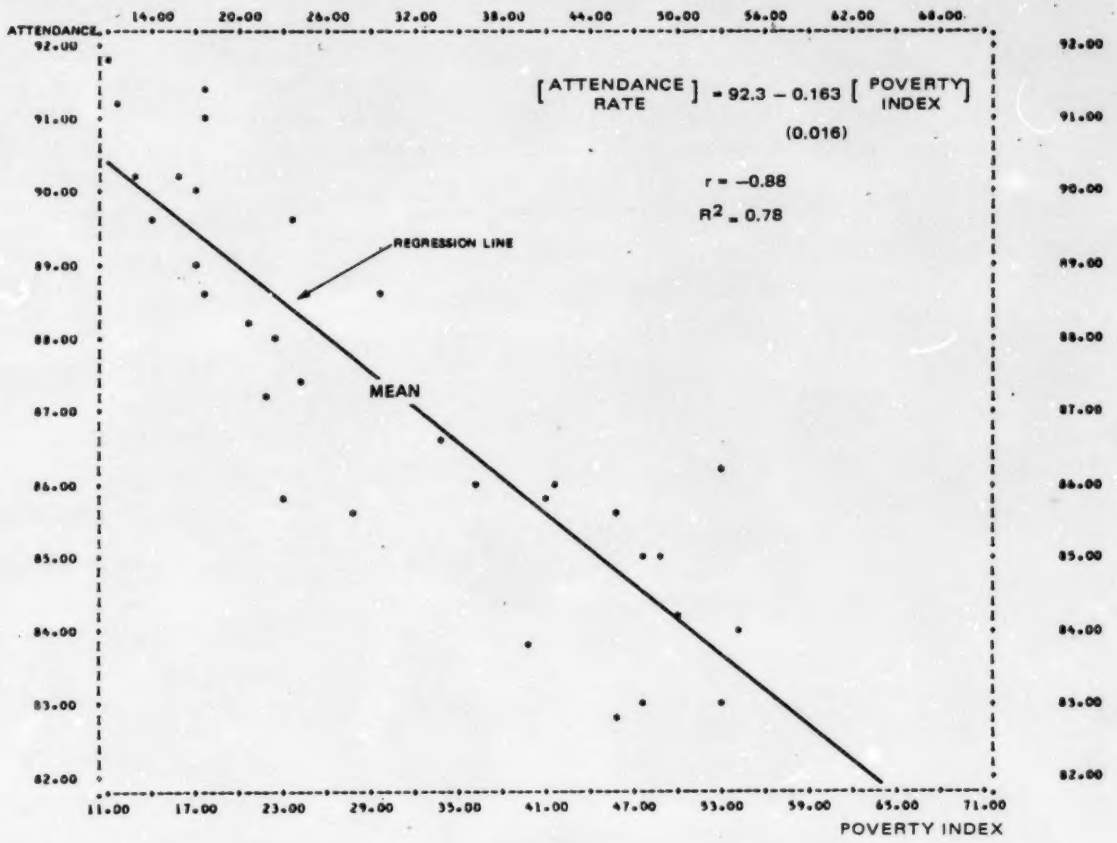

EXHIBIT 10

EXPLANATION OF CORRELATION COEFFICIENTS (r)

Correlation coefficients range from −1.0 to +1.0. The closer the coefficient is to +1.0 or −1.0, the stronger is the relationship between variables. The closer it is to 0, the weaker the relationship. Positive correlations indicate that high values of one variable are associated with high values of the other. Negative correlations indicate that low values of one variable are associated with high values of the other. The size of the coefficient tells us how well we can predict one thing if we know another.

There are, of course, almost no correlations in the social world that are equal to 1.0. There is almost always some variation in one variable among people who are the same with respect to another variable. Such associations, in which knowing one variable tells you something but not everything about the other variable, are represented by correlation coefficients that fall between 0 and ±1.0. *

* Jencks, Christopher. Inequality. New York: Basic Books, 1972, pp. 354–6

EXHIBIT 11

REGRESSION OR LEAST SQUARES

- PROBLEM: Find the line $y = a + bx$ that best fits the scatter of points.
  - Same Problem: Find values of a and b that give the best fit to the scatter of points.
- Regression estimates have the following desirable characteristics:
  - Linear: They are linear functions of y; i.e., $a = \alpha_0 + \alpha_1 Y$ and $b = \beta_0 + \beta_1 Y$
  - Unbiased: On the average, the estimates will be right on target.
  - Efficient: The standard errors of the estimates are small.
- Regression is a method for estimating a and b.
- The method is based on minimizing the sum of the squared vertical distances of points from the line; i.e., least squares.

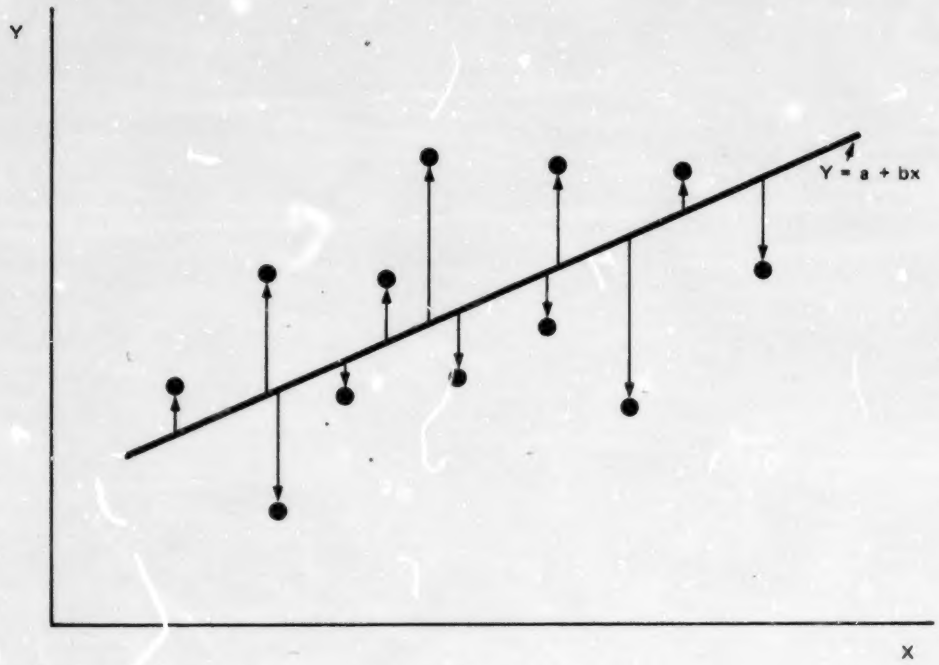

EXHIBIT 12

EXPLANATION OF COEFFICIENTS OF DETERMINATION (R^2)

Coefficients of determination range from 0 to 1.0. The coefficient measures the goodness of fit of a regression equation to a scatter of points. The close the coefficient is to 1.0, the better is the fit. The closer it is to 0, the worse is the fit. The size of the coefficient tells us how well we can predict one thing if we know another.

There are, of course, almost no R^2's in the social world that are equal to 1.0. There is almost always some variation in one variable among people who are the same with respect to another variable. Such associations, in which knowing one variable tells you something but not everything about the other variable, are represented by regression equations with goodness of fits that fall between 0 and 1.0.

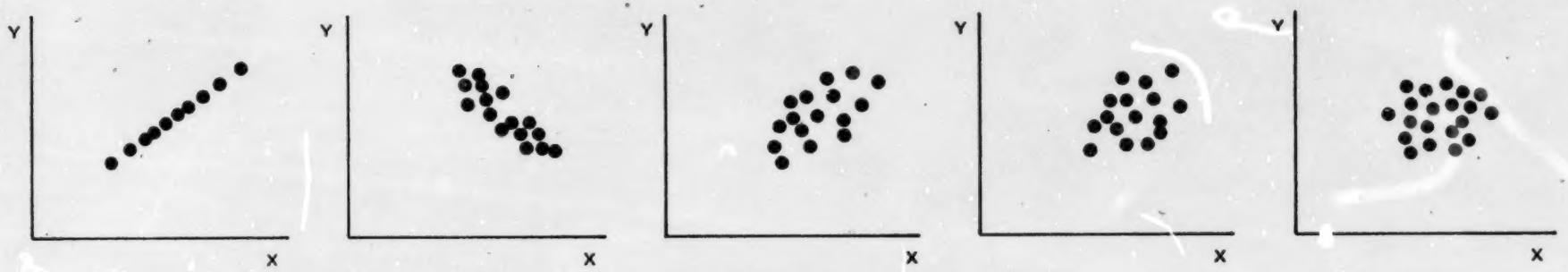

EXHIBIT 13

SIMPLE CORRELATION COEFFICIENTS

	ATTENDANCE RATE	POVERTY INDEX	WEALTH INDEX	TURNOVER INDEX	DEPENDENCY INDEX	WORKLOAD INDEX
ATTENDANCE RATE	1.00	-0.88	0.87	-0.78	-0.64	0.20
POVERTY INDEX	-0.88	1.00	-0.91	0.72	0.80	-0.39
WEALTH INDEX	0.87	-0.91	1.00	-0.74	-0.74	0.34
TURNOVER INDEX	-0.78	0.72	-0.74	1.00	0.55	-0.22
DEPENDENCY INDEX	-0.64	0.80	-0.74	0.55	1.00	-0.26
WORKLOAD INDEX	0.20	-0.39	0.35	-0.22	-0.26	1.00

EXHIBIT 14

REGRESSION OF ATTENDANCE AND POVERTY

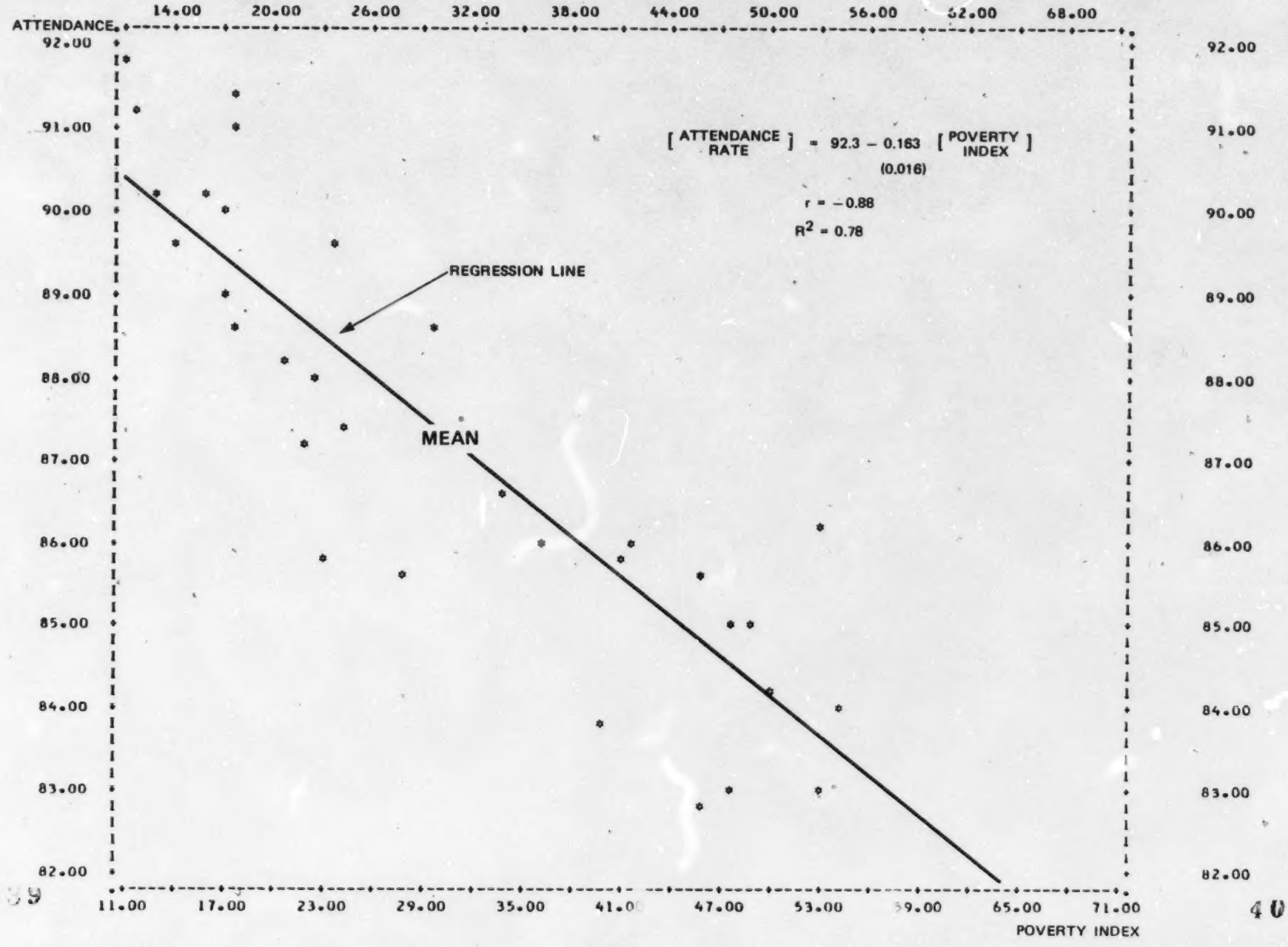

EXHIBIT 15

ATTENDANCE AND WEALTH

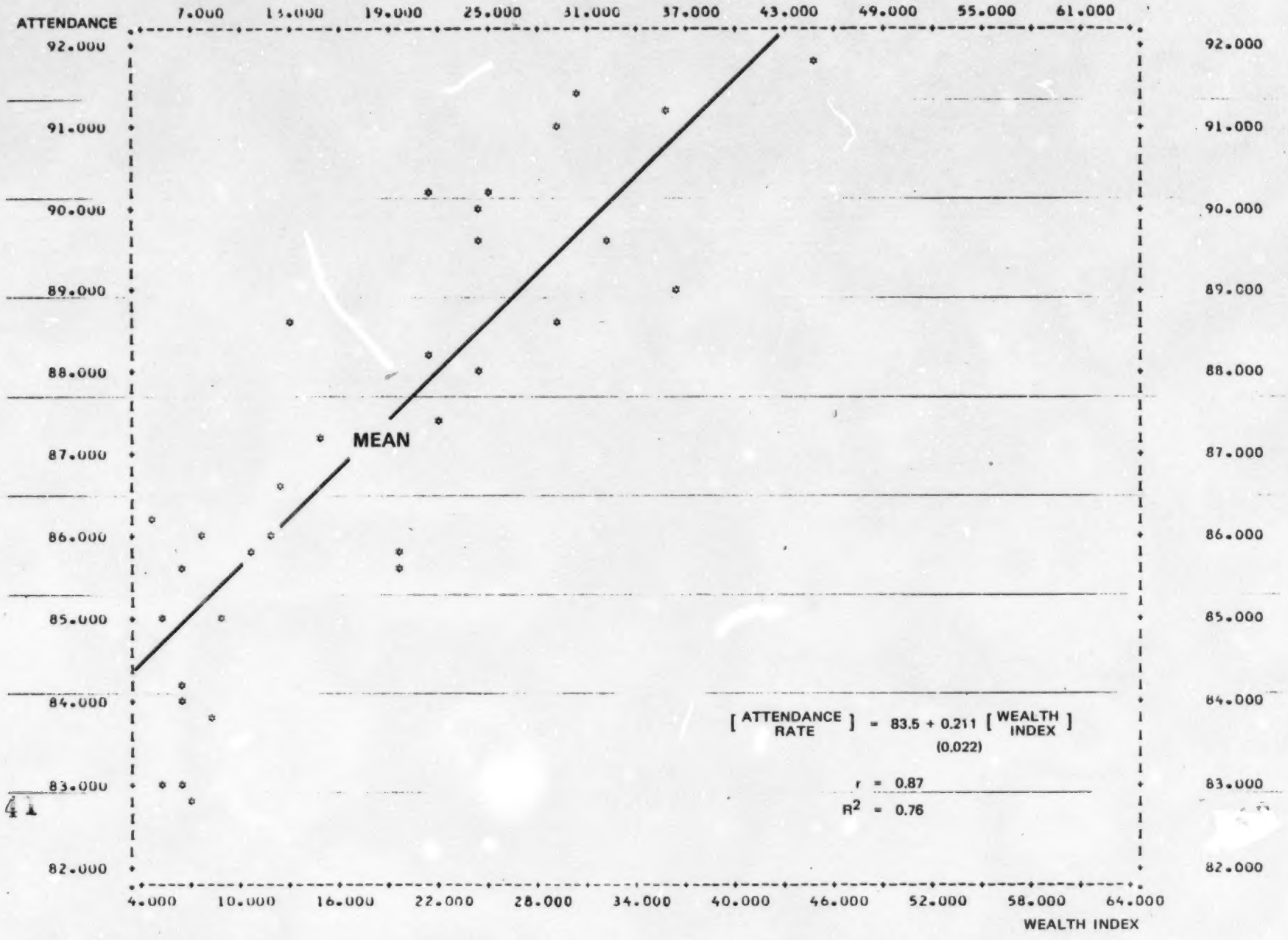

EXHIBIT 16

ATTENDANCE AND NEIGHBORHOOD INSTABILITY

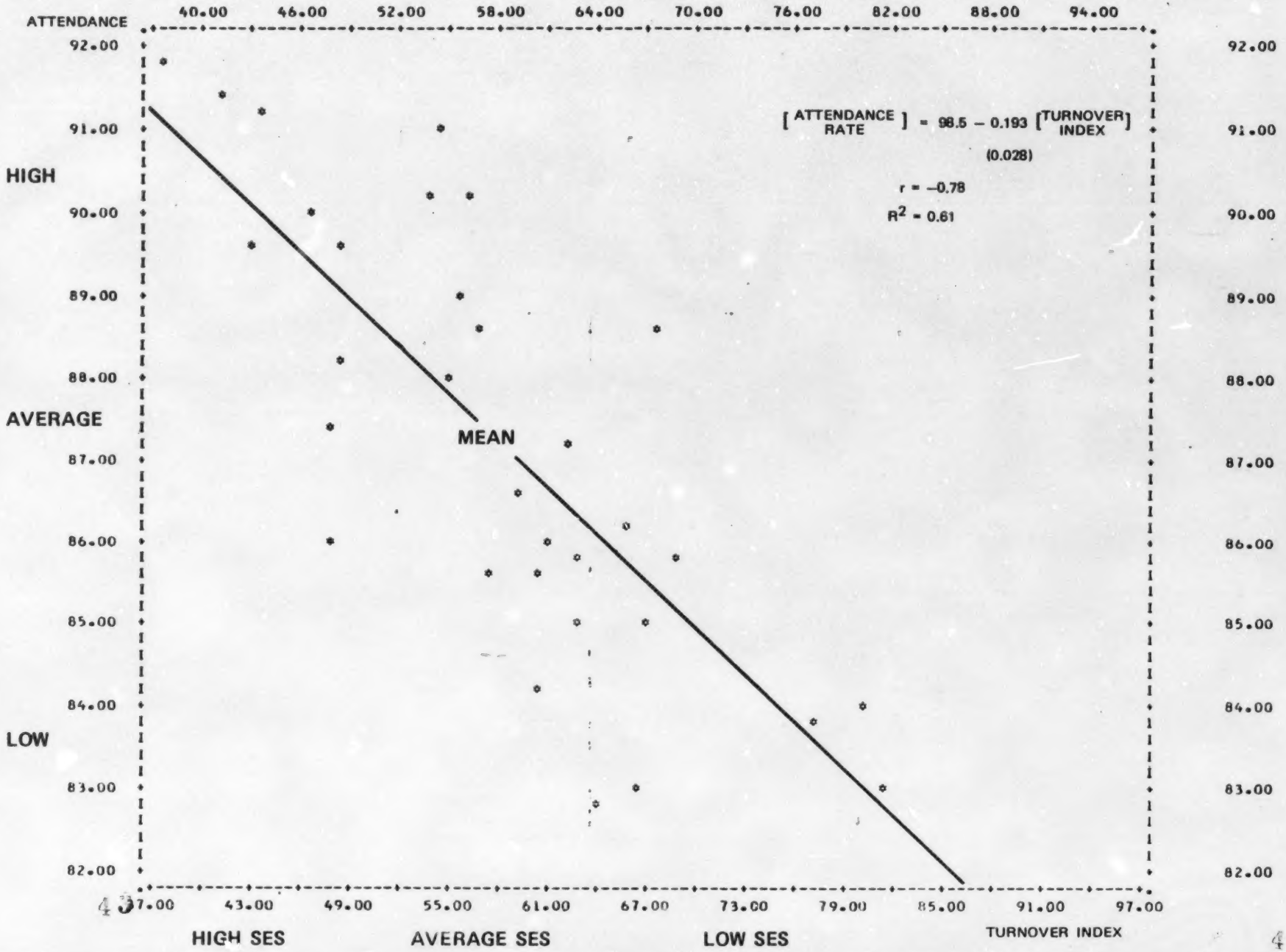

EXHIBIT 17

ATTENDANCE AND DEPENDENT POPULATION

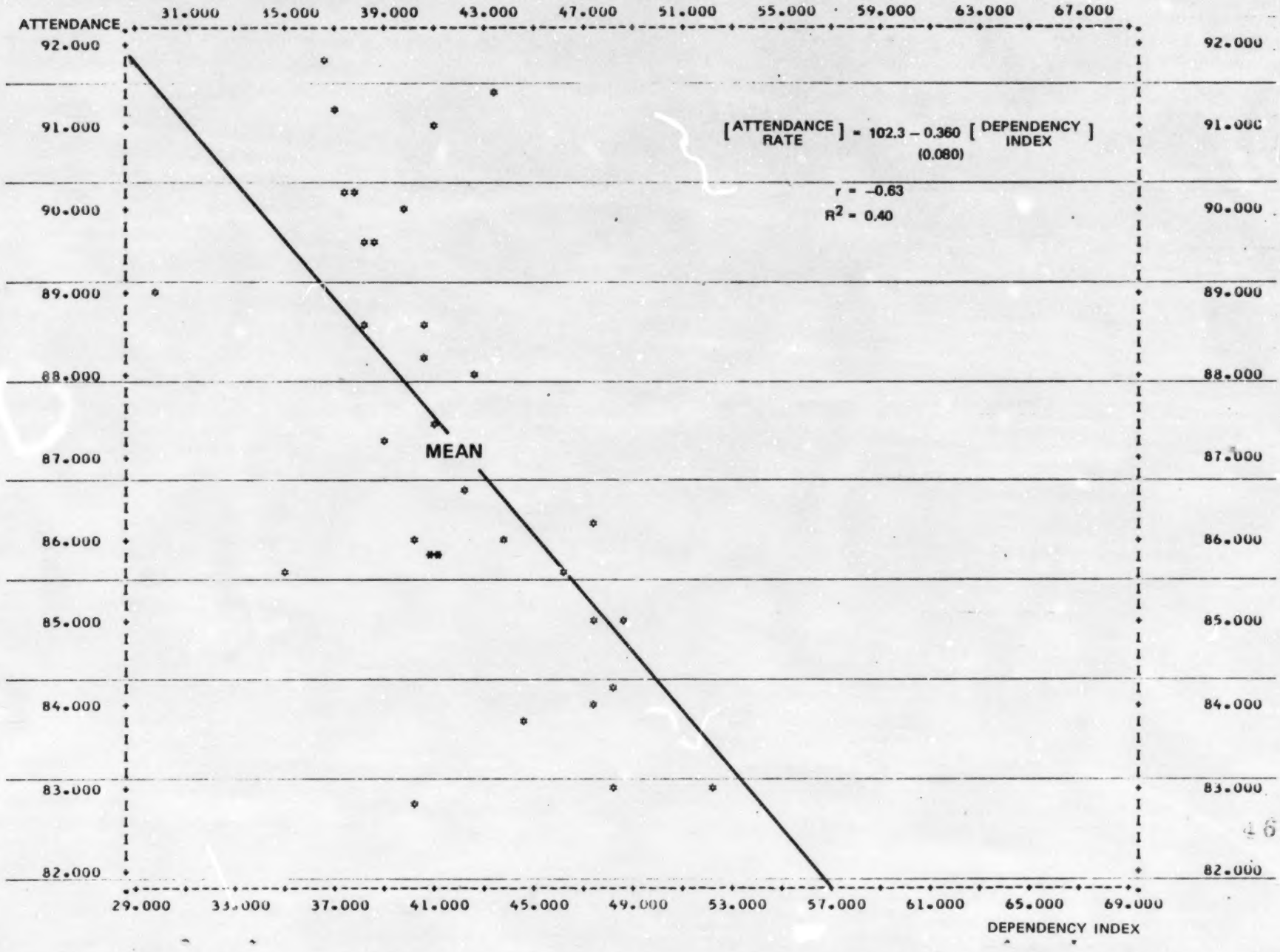

EXHIBIT 18

ATTENDANCE & ATTENDANCE TEACHER AND GUIDANCE COUNSELOR WORKLOAD

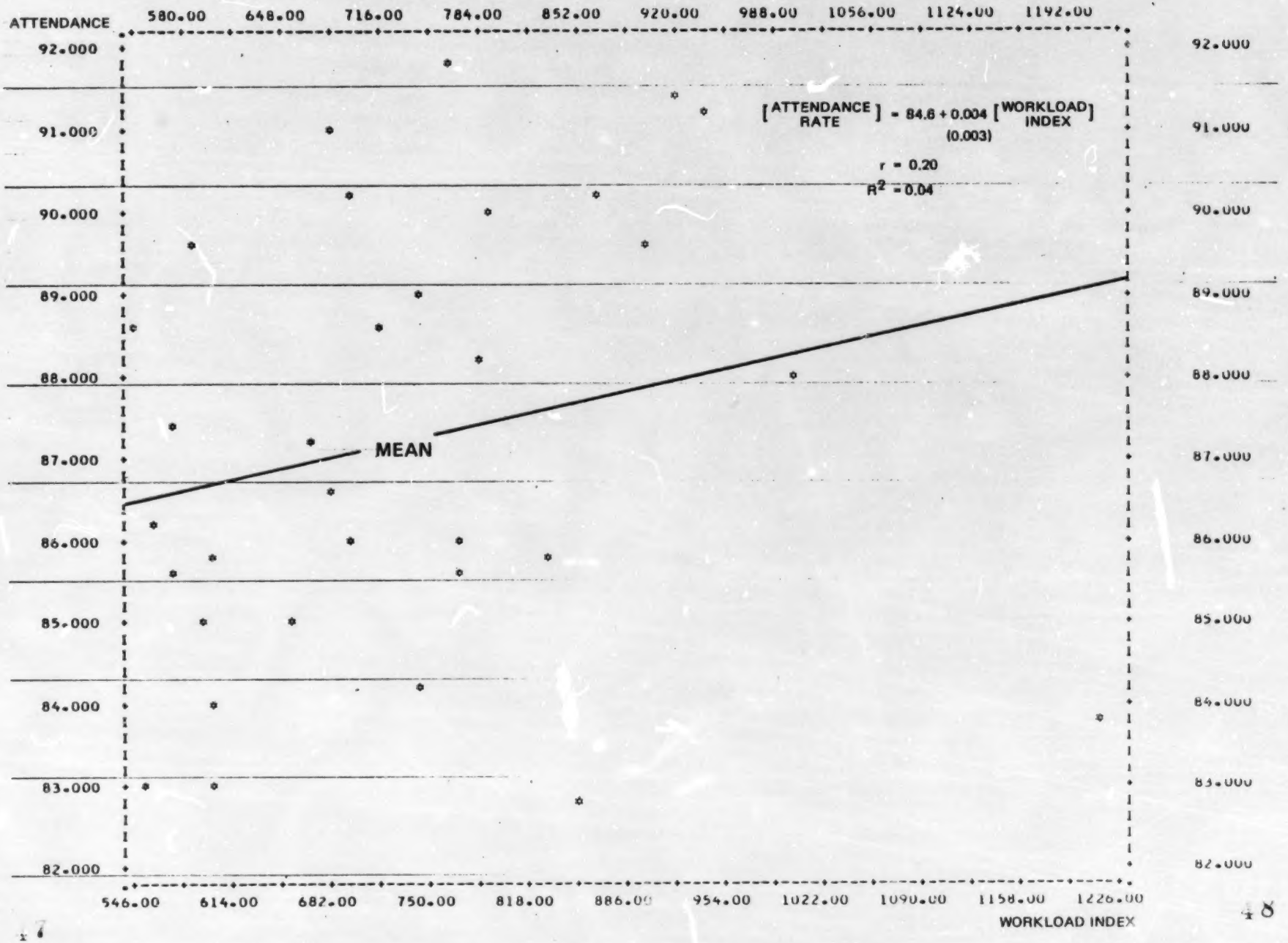

EXHIBIT 19

MULTIPLE REGRESSION RESULTS

1. ATTENDANCE AND SOCIO-ECONOMIC STATUS

$$\begin{bmatrix}\text{ATTENDANCE}\\ \text{RATE}\end{bmatrix} = 88.4 - \underset{(0.038)}{0.110}\begin{bmatrix}\text{POVERTY}\\ \text{INDEX}\end{bmatrix} + \underset{(0.046)}{0.071}\begin{bmatrix}\text{WEALTH}\\ \text{INDEX}\end{bmatrix} - \underset{(0.028)}{0.060}\begin{bmatrix}\text{TURNOVER}\\ \text{INDEX}\end{bmatrix} + \underset{(0.071)}{0.107}\begin{bmatrix}\text{DEPENDENCY}\\ \text{INDEX}\end{bmatrix}$$

$$R^2 = 0.85$$

2. ATTENDANCE, SOCIO-ECONOMIC STATUS AND WORKLOAD

$$\begin{bmatrix}\text{ATTENDANCE}\\ \text{RATE}\end{bmatrix} = 90.1 - \underset{(0.037)}{0.126}\begin{bmatrix}\text{POVERTY}\\ \text{INDEX}\end{bmatrix} + \underset{(0.043)}{0.073}\begin{bmatrix}\text{WEALTH}\\ \text{INDEX}\end{bmatrix} - \underset{(0.027)}{0.054}\begin{bmatrix}\text{TURNOVER}\\ \text{INDEX}\end{bmatrix} + \underset{(0.067)}{0.120}\begin{bmatrix}\text{DEPENDENCY}\\ \text{INDEX}\end{bmatrix} - \underset{(0.001)}{0.003}\begin{bmatrix}\text{WORKLOAD}\\ \text{INDEX}\end{bmatrix}$$

$$R^2 = 0.87$$

EXHIBIT 20

GOODNESS OF FIT OF REGRESSION EQUATIONS RELATING

TO ATTENDANCE SOCIO-ECONOMIC STATUS AND WORKLOAD

	R^2 OF SIMPLE REGRESSION	R^2 OF MULTIPLE REGRESSION
Proverty Index	0.78	
Wealth Index	0.76	0.85
Turnover Index	0.61	
Dependency Index	0.40	0.87
Workload Index	0.04	

EXHIBIT 21

STANDARD DEVIATION OF ATTENDANCE

ADJUSTED FOR SOCIO-ECONOMIC STATUS AND WORKLOAD

	STANDARD DEVIATION AFTER SIMPLE REGRESSION	STANDARD DEVIATION AFTER MULTIPLE REGRESSION
Poverty Index	1.28	
Wealth Index	1.33	1.12
Turnover Index	1.73	
Dependency Index	2.11	1.06
Workload Index	2.67	

Standard deviation of attentance = 2.69